
ADVENTURES
IN WEB ANIMATIONS

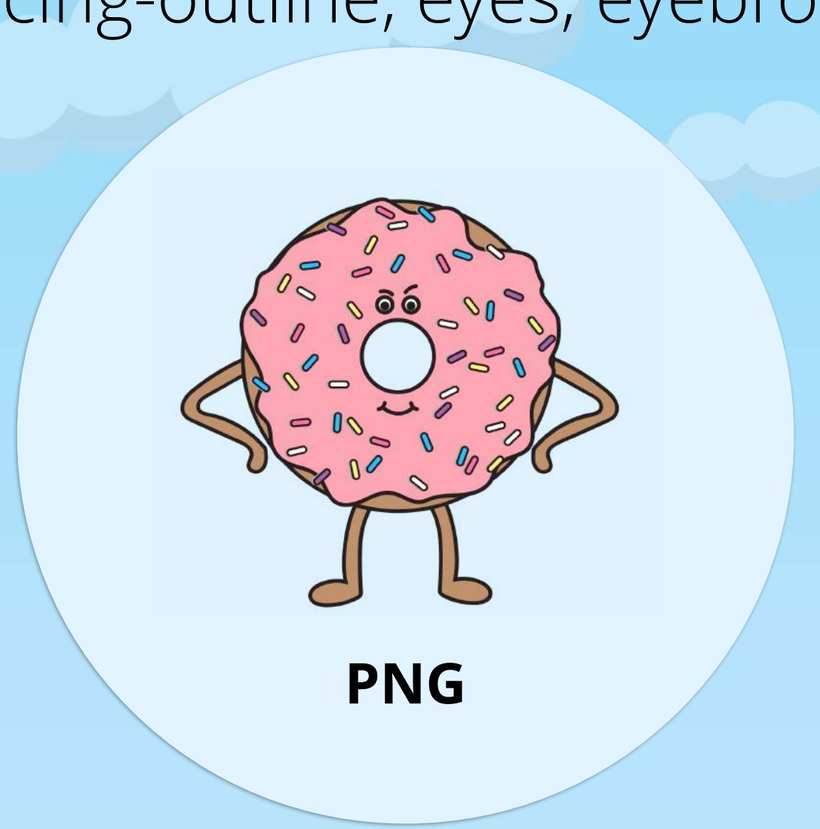
Level 4 – SVG

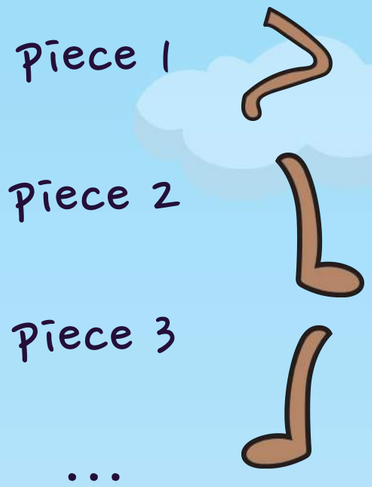
SECTION 1

Animating SVGs With CSS

Animating Lots of PNGs Together Is Tedious

The donut is comprised of a **ton** of pieces: arms, legs, body, icing-fill, icing-outline, eyes, eyebrows — the list goes on.

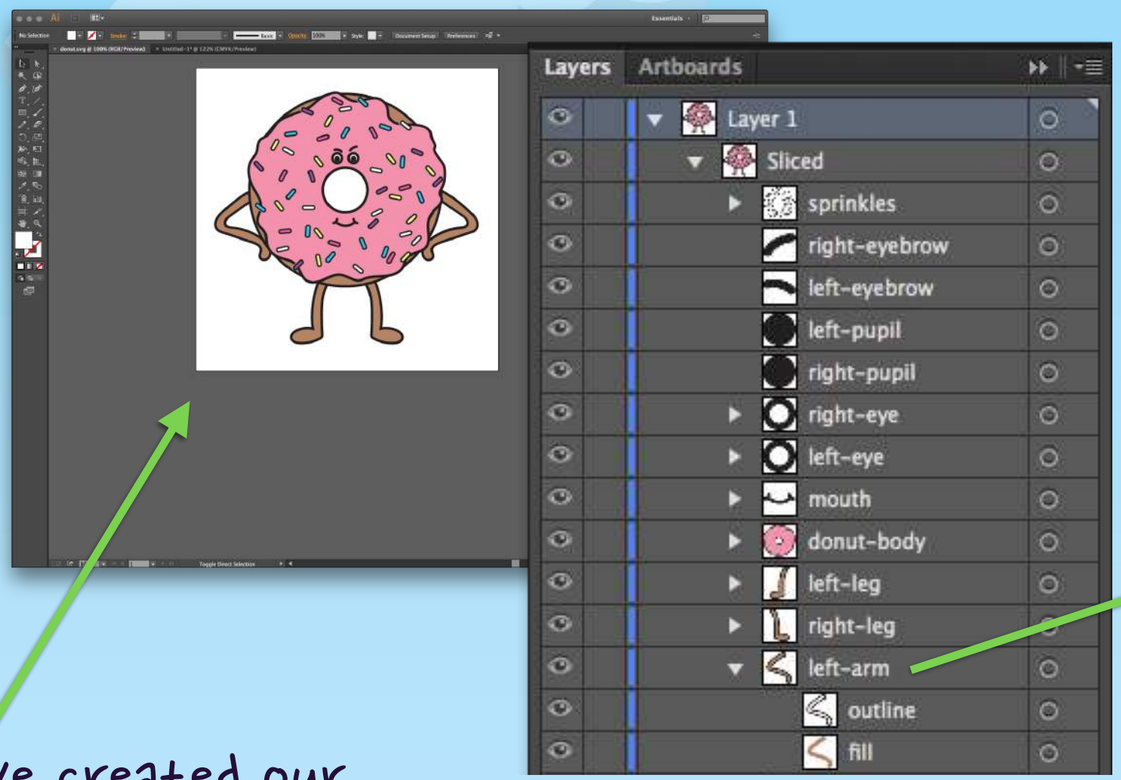




If we use an SVG donut image, we'll be able to easily animate the icing, sprinkles, and any other part of the donut!

Getting SVG Assets

You can create your own SVG asset or find a free/paid asset online.



we created our SVG donut in Adobe Illustrator

Labeling layers in Illustrator will assign ids in the SVG file when saving it out.

SVG

```svg
<g id="left-arm">
  <path id="fill" d="M123...."/>
  <path id="outline" d="M123..."/>
</g>
```

What Is SVG?

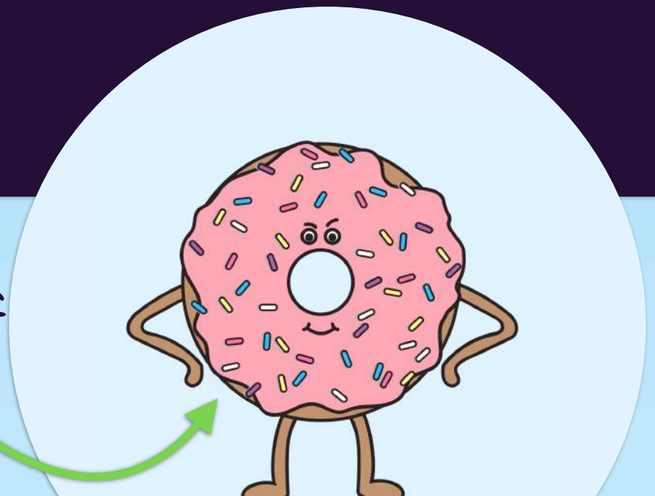
SVG is a file format that contains vector-based images.

SVG

```
<?xml version="1.0" encoding="utf-8"?>
<svg x="0px" y="0px" viewBox="0 91 612 612">
   <style type="text/css">...</style>
   <g id="donut">
      <g id="right-arm">...</g>
      <g id="left-arm">...</g>
      <g id="right-leg">...</g>
      <g id="left-leg">...</g>
      <g id="donut-body">...</g>
      ...
   </g>
</svg>
```

different animatable parts are in different elements

SVG version of the donut



SVG is written in XML, another tag-based language!

Replacing PNGs With SVGs

SVG can be dropped in your HTML file wherever you're normally loading PNG (or other) images.

HTML

```
<section class='contact'  id='contact'>
  <div class='cell well'>
    <h2>Contact Us</h2>
    <div id="donut">
      <image id="left-arm" src="https://s3.../left-arm.png"></image>
       ...
    </div>
    <p>...</p>
  </div>
</section>
```

Let's delete these PNG images...

...and replace them with one SVG image.

SVG

```
<?xml version="1.0" encoding="utf-8"?>
<svg x="0px" y="0px" viewBox="0 91 612 612">
  <style type="text/css">...</style>
  <g id="donut">
    <g id="right-arm">...</g>
    <g id="left-arm">...</g>
    <g id="right-leg">...</g>
```

Bonus: SVG Images Are Always Crisp

Without any additional work, SVG donut is as crisp as the day he was freshly fried!

No matter how much you zoom, SVG donut is still lookin' good!

SVG zoomed in

PNG zoomed in

Accessing Elements in SVG

HTML

```
<section class='contact'  id='contact'>
   <div class='cell well'>
     <h2>Contact Us</h2>
     <?xml version="1.0" encoding="utf-8"?>
     <svg x="0px" y="0px" viewBox="0 91 612 612">
       <style type="text/css">...</style>
       <g id="donut">
         <g id="right-arm" class="st0" d="M302...">...</g>
         <g id="left-arm" class="st1" d="M302...">...</g>
         <g id="right-leg" class="st2" d="M302...">...</g>
         <g id="left-leg" class="st3" d="M302...">...</g>
         <g id="donut-body" class="st4" d="M302...">...</g>
         <g id="sprinkles" class="st5" d="M302…">…</g>
         ...
       </g>
     </svg>
     ...
 </section>
```

We can access specific SVG tags with CSS selectors

Elements Accessed in SVG

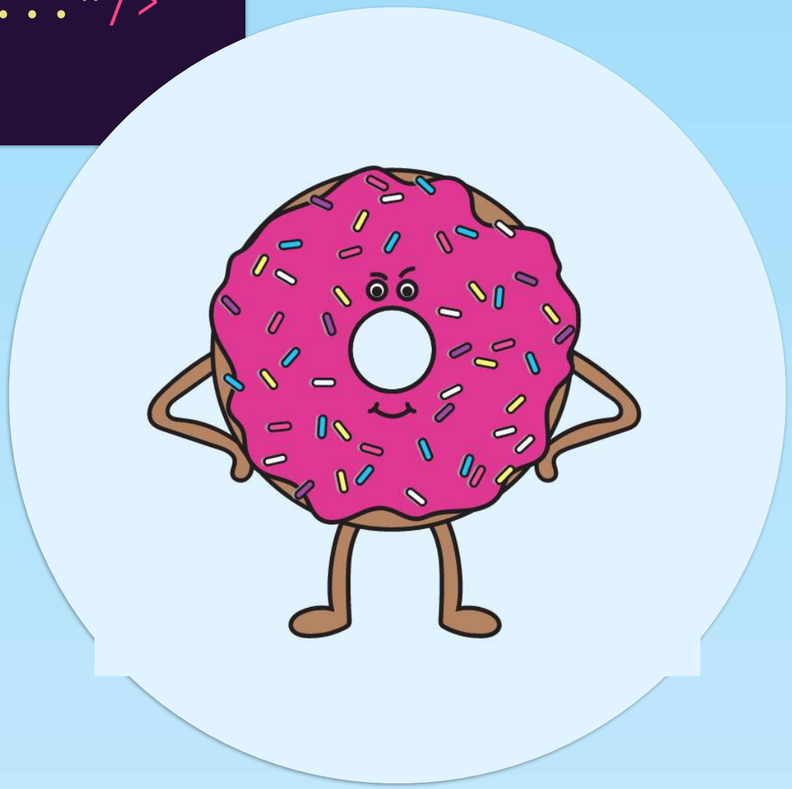
HTML

```
<g id="donut-body">
   <path id="donut-fill" class="st0" d="M302..."/>
   <path id="donut-outline" class="st1" d="M302..."/>
   <path id="icing-fill" class="st2" d="M503..."/>
   <path id="icing-outline" class="st1" d="M237..."/>
</g>
```

CSS

```
#icing-fill {
   fill: #DD3D93;
}
```

we couldn't do this with PNG!



Animating the Icing-fill Color

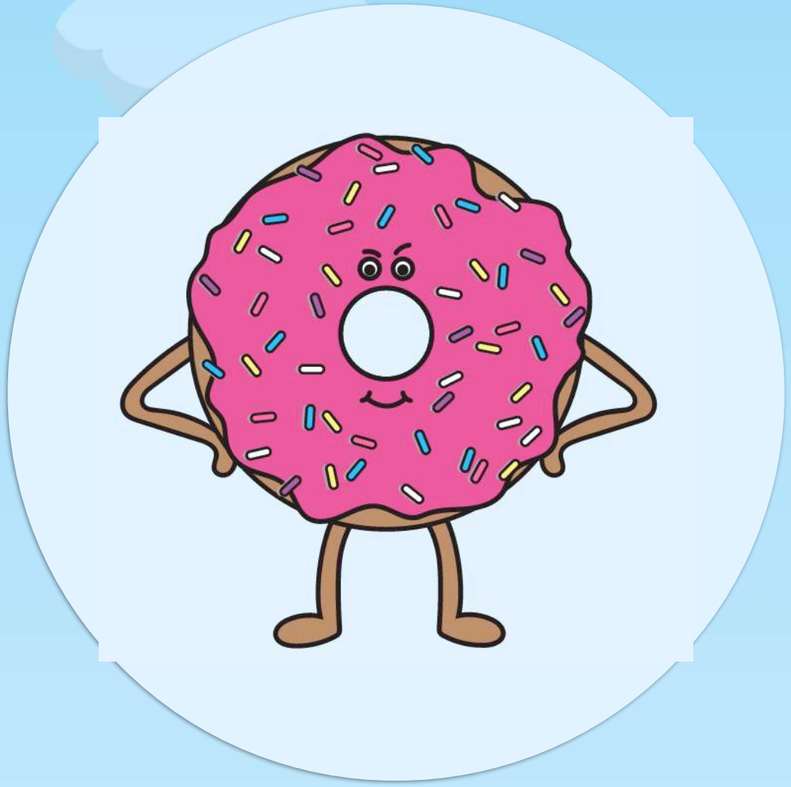
We can now animate our icing darker to show our donut's frustration with those pesky sprinkles!

CSS

```
@keyframes darken {
  0% {fill: #FCA9B7;}
  100% {fill: #DD3D93;}
}


#icing-fill {
  animation: darken 3s infinite;
}
```

SVG uses fill instead of background-color



Unique Properties for Styling SVGs

SVG has some unique CSS properties that can be animated.

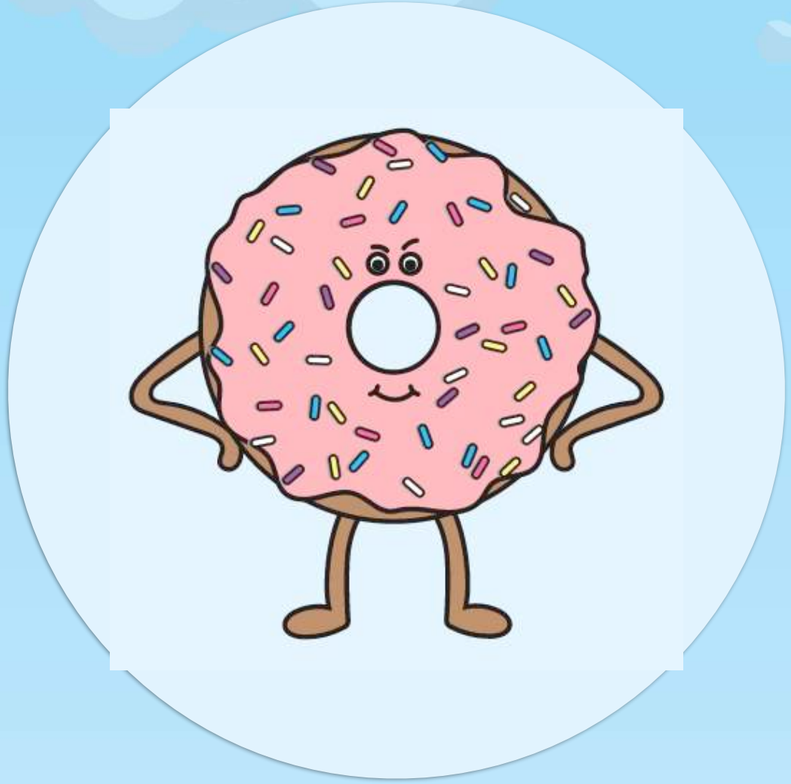
```
enable-background
fill
fill-opacity
filter
mask
stroke
stroke-dasharray
stroke-dashoffset
viewport-fill
viewport-fill-opacity
```

Check out MDN for the full list of **SVG properties**.

http://go.codeschool.com/svg-css-properties

Shake It Off!

We are getting close! The last animations that need to happen are the sprinkles and icing shaking and the sprinkles flying off.



Animating Multiple Properties in a Keyframe

This keyframe animation will be used to rotate, scale, and fade the sprinkles, effectively imitating what sprinkles flying off would look like.

CSS

```css
@keyframes flyoff {
  0% {transform: rotate(0deg);}
  10% {transform: rotate(30deg);}
  20% {transform: rotate(0deg);}
  30% {transform: rotate(-30deg);}
  40% {transform: rotate(0deg);}
  45% {opacity: 1;}
  50% {
    transform: rotate(100deg) scale(3);
    opacity: 0;
  }
  100% {
    opacity: 0;
    transform: scale(1);
  }
}
```

rotating sprinkles back and forth

rotating further and scaling really large for "flyoff effect"

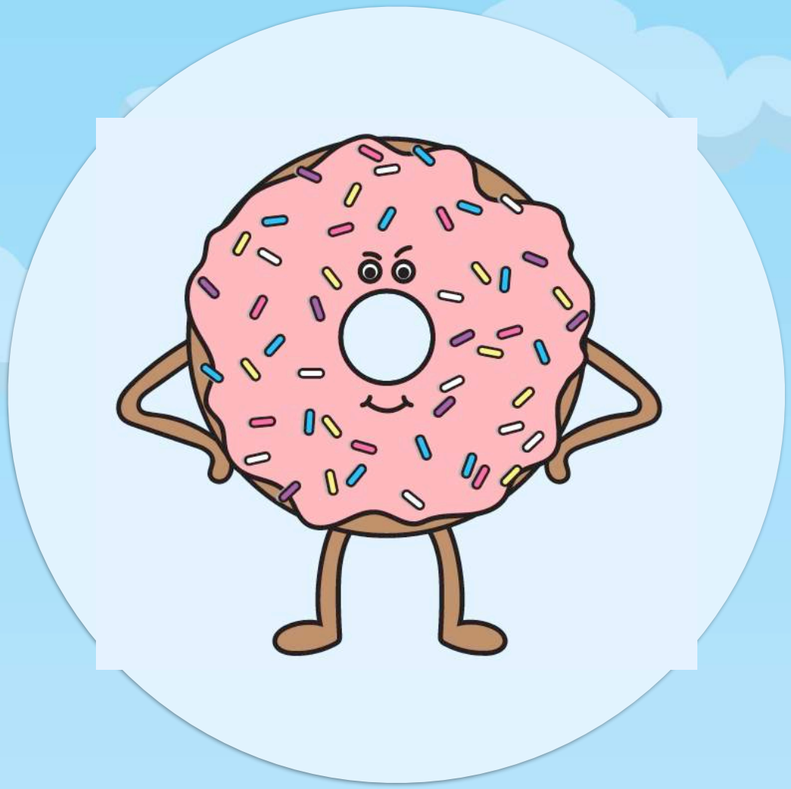
reset the scale at the end of the animation so the loop looks more natural

The Sprinkle Animation in Action

CSS

```
@keyframes flyoff {
    ...
}


#sprinkles {
  transition: transform 2s;
  transform-origin: 302px 337px;
  animation: flyoff 3s infinite ease-in;
}
```



Animating the Icing

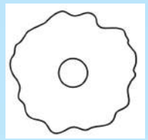
The icing is made up of 2 parts: the outline and the filled color.

we've added this same animation to the icing-fill...

CSS

```
#icing-fill {
  animation: darken 3s infinite,
             shake 3s infinite ease-out;
  transform-origin: 302px 337px;
}
#icing-outline {
  animation: shake 3s infinite ease-out;
  transform-origin: 302px 337px;
}
```

...and to the icing-outline.

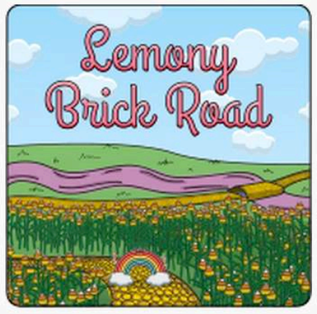


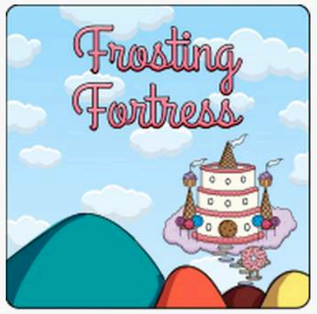
Shake Animation for Icing

CSS

```
@keyframes shake {
  0% {transform: rotate(0deg);}
  10% {transform: rotate(30deg);}
  20% {transform: rotate(0deg);}
  30% {transform: rotate(-30deg);}
  40% {transform: rotate(0deg);}
  50% {transform: rotate(100deg);}
}
```

Our Donut SVG Is Now Animating Wonderfully





CONTACT US

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